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Transport of Fresh Water across the Shallow Vietnamese Continental Shelf and Slope

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LONG-TERM GOALS

Our research seeks to determine processes which contribute to the transport of fresh water from the coast to the deep basin of the South China Sea, as well as determine the factors that determine the variability of this transport.

OBJECTIVES

We will participate in research cruises in 2013 and 2014 over the continental shelf and slope east of southern Vietnam to measure the distribution and offshore transport of fresh water across the continental shelf and continental slope.

APPROACH

We will be doing surveys with towed instruments to obtain high resolution hydrography over the continental shelf and slope during both the summer and winter monsoons as well as in the spring, which is a transitional period between the monsoons. We will be measuring both the alongshelf distribution of fresh water as well as its cross-shelf transport. An offshore directed jet of shelf water is frequently observed in satellite sea surface temperature imagery and determining important dynamical quantities such as vertical structure, width, maximum velocity, and lateral velocity shear in the jet is the primary aim of the field observations. We will be working closely with numerical modelers who will be using this data for detailed modeling studies.

WORK COMPLETED

Our efforts of the past year have primarily been directed towards planning of the joint field work. In March, 2012, three Vietnamese scientists from MOST visited WHOI and engaged in discussions about inter-disciplinary collaborative work with our joint cruises. We discussed scientific objectives as well as specific conditions east of Vietnam that affect ship operations.

In May, 2012, Kirincich travelled to Vietnam for a joint planning meeting. This involved discussion of all aspects of this program, including geographical areas for sampling, likely processes and their underlying dynamics, and timing and science activities associated with the cruises. During the

summer, a joint planning document consisting of plans for attainment of the science objectives was written with input from all the program participants.

RESULTS

Also over the past year, Kirincich has been working to develop a collaboration between VASI's Center for Oceanography and the joint program that should enable Vietnamese-based HF radar surface currents of the joint program study area during the planned cruises in 2014 and possibly 2013. Kirincich met with VASI personnel during earlier planning meetings (Sept 2011) and in-depth with VASI-CfO personnel during and after the May 2012 planning meeting regarding their existing and planned HFR systems. These interactions led VASI to alter their deployment strategy to focus on the joint program's study area in the coming years. Kirincich and VASI developed, and are pursuing plans for a HFR data analysis workshop to be held in country in early 2013, a planned US visit by a member of the VASI CfO science team for additional technical exchanges, and the involvement of HFR results/datasets in many aspects of the Joint Programs sub topic goals.

IMPACT/APPLICATIONS

The research from this project will give us a better understanding of continental shelf and slope processes, hydrographic variability and current structure near the shelfbreak, and allow for much better interpretation of remote sensing products in the region by defining the sub-surface structure underlying surface sea surface temperature patterns. The data from the project will assist in the representation of smaller scale features in numerical models of the South China Sea.

RELATED PROJECTS

The project has links to the Quantifying, Predicting, and Exploiting Uncertainty DRI as well as to other ONR programs relating to the South China Sea.